

CONCEPTUAL CATEGORIES SCAFFOLD VERBAL SEMANTIC STRUCTURE: A CROSS-CULTURAL STUDY OF CHILD HOMESIGN

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In language evolution, formation of conceptual categories preceded formation of linguistic semantic categories (Hurford, 2007). The mapping from concepts to semantics is non-isomorphic, however, as particular languages categorize conceptual space in divergent ways (e.g. English *put in* is acceptable for both tight-fit and loose-fit relations, while Korean *kkita* encodes tight-fit relationships only; Choi & Bowerman, 1991). Despite this variation, are there crosslinguistic patterns in how words lexicalize conceptual space? We address this question analyzing how child homesigners from four different cultures describe instrumental events (e.g. cutting bread with a knife). Homesigners are congenitally deaf individuals who have not been taught a signed language. Despite growing up without structured linguistic input, these individuals use a gestural system ("homesign") to communicate (Goldin-Meadow, 2003). We find that homesign descriptions of instrumental events reflect categories present in adult English, Spanish and Mandarin, suggesting crosslinguistic biases for how verbs encode the conceptual space of events, biases which may have been present over the course of language evolution.

In English, verbs such as *slice*, *stab* and *write* encode the presence of an instrument, but *eat*, *break* and *open* do not (Koenig et al., 2003; Rissman et al., 2015; we label these strong and weak instrumental verbs, respectively). Rissman (2013) found that Spanish and Mandarin verbs fall into similar strong and weak instrumental categories as in English, suggesting that instruments are conceptually more salient in some events (e.g. slicing bread with a knife) than in others (e.g. eating pasta with a fork). We tested this explanation by analyzing instrumental gestures in homesign: as homesigners are not learning any established language, their descriptions reflect internally-driven pressures on the shape of language, and conceptual knowledge is one such pressure.

Nine homesigners from four cultures described cartoon pictures of instrumental events, sometimes at multiple ages (1 from the United States: 3;5-4;10, 1 from Taiwan: 4;3-5;3, 1 from Nicaragua: 7;0-8;3, 6 from Guatemala: 8;6-11;4, 6;8, 10;10, 11;0-12;0, 6;11, 9;1-9;10). For signs representing an action, we coded the morphosyntactic feature of *handshape type*: whether the sign had handling

handshape (a grasping hand represents holding a knife) or instrumental handshape (a flat hand represents the shape of the knife); see Padden et al. (2013). We then asked adult native speakers of English, Spanish and Mandarin to describe the same cartoon pictures, and asked separate groups of native speakers to categorize the verbs used by the first groups as either strong or weak, following Koenig et al. (2003) and Rissman (2013). Finally, we categorized each cartoon picture as to whether all three languages predominantly used strong instrumental verbs ("all strong"), as opposed to using predominantly weak instrumental verbs ("all weak"), or a mix of strong and weak instrumental verbs ("mix"). If English, Spanish, Mandarin and child homesign draw on similar instrumental event concepts, we predict that "all strong" pictures will be more likely to elicit instrumental handshape among the homesigners.

Figures 1 and 2 show the proportion of signs where a homesigner produced instrumental handshape, for each of the three picture types, for each homesigner. Our prediction was met: 8 out of 9 children were more likely to use instrumental handshape for "all strong" pictures. This suggests a basis for the strong/weak distinction that is not driven by language input. One possibility is that at a conceptual level, some events have more salient instruments than others, a conceptual categorization that may have influenced language evolution and led to common patterns of lexicalization across languages.

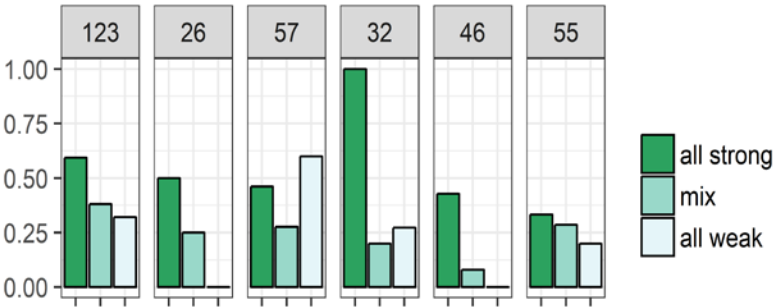


Figure 1. Guatemalan homesigners: proportion of signs with instrumental handshape, by whether the sign was describing an all strong, all weak or mix picture type. Total number of signs per child shown in panel label.

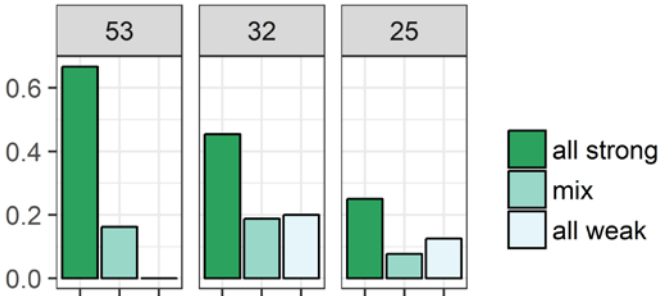


Figure 2. Nicaraguan, Taiwanese & U.S. homesigners (Panels 1, 2 & 3, respectively): proportion of signs with instrumental handshape, by whether the sign was describing an all strong, all weak or mix picture type. Total number of signs per child shown in panel label.

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